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$$y = \frac{\sin x - 2}{2 \cos x + 1} \neq 0 \quad 2 \cos x + 1 \neq 0 \quad 2 \cos x \neq -1 \quad \cos x \neq -\frac{1}{2} = \pm \frac{\sqrt{3}}{2}$$

طبق دایره ششگانه

$$D = R - \left\{ \pm \frac{\pi}{3} + 2k\pi \right\}$$

$$y = \frac{\sin x + 3}{\cos x - 1} \quad \text{پ} \quad \checkmark \quad D = R - \{2k\pi\}$$

$$\cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \quad x \neq 2k\pi$$

$$y = \frac{2 \sin x + 1}{\tan x + 1} \quad \cos x \neq 0 \quad x \neq \frac{\pi}{2} + k\pi$$

تangent تعریف نشود

$$\tan x \neq -1 \Rightarrow x \neq -\frac{\pi}{4} + k\pi$$

$$D = R - \left\{ \frac{\pi}{2} + k\pi, -\frac{\pi}{4} + k\pi \right\}$$

$$y = \frac{\cos x + 1}{\cot x - 1} \quad \sin x \neq 0 \Rightarrow x \neq k\pi \quad D = R - \left\{ k\pi, \frac{\pi}{2} + k\pi \right\}$$

cotangent تعریف نشود

$$\cot x \neq 1 \Rightarrow x \neq \frac{\pi}{4} + k\pi$$

$$\sin y = x^2 - 2 \quad -1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3 \quad D = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$$

$$y = \arccos(\sqrt{x} - 3) \quad \text{پ} \quad \checkmark$$

$$-1 \leq \sqrt{x} - 3 \leq 1 \Rightarrow 2 \leq \sqrt{x} \leq 4 \Rightarrow 4 \leq x \leq 16$$

$$D = [4, 16]$$

$$\cos y = |x| - 3 \quad D = [-4, -2] \cup [2, 4]$$

$$-1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4$$

$$y = \arcsin(x^2 + 3x + 1) \quad \text{۱۱۵} \quad \checkmark$$

$$-1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow x \in [-3, -2] \cup [-1, 0]$$

$$D = [-3, -2] \cup [-1, 0]$$

$$y = \log_{\frac{1}{3}}(x^2 - 2) \quad x^2 - 2 > 0 \quad x > \sqrt{2} \quad \Rightarrow x < -\sqrt{2}$$

$$D = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$$

$$y = \log_{\frac{1}{3}}(2 - |x|) \quad \text{پ} \quad \checkmark$$

$$2 - |x| > 0 \Rightarrow |x| < 2$$

$$D = (-2, 2)$$

$$y = 1 \cdot g_{n-r}^{a-n} \quad a-n > 0 \Rightarrow n < a \quad D = (r, a) - \{r\}$$

$$n-r > 0 \Rightarrow n > r$$

$$n-r \neq 1 \Rightarrow n \neq r+1$$

$$y = 1 \cdot g_{n+r}^{n^r-1} \quad D = (-r-1) - \{-r\} \cup (1, \infty)$$

$$n^r-1 > 0 \Rightarrow n < -1 \Rightarrow n > 1$$

$$n+r > 0 \Rightarrow n > -r \quad n+r \neq 1 \Rightarrow n \neq -r+1$$

$$y = 1 \cdot g_{n-r}^{\frac{n^r-rn+r}{n-r}} > 0 \quad n^r-rn+r = (n-1)(n-r)$$

$$D = (1, r) \cup (r, \infty) \quad (n-1) > 0 \mid n \neq r \mid n > 1$$

$$y = 1 \cdot g_{n+a}^{\frac{n+r}{n-r}} > 0 \quad D = (-\infty, -r) \cup (r, \infty)$$

$$n \in (-\infty, -r) \cup (r, \infty) \quad n \neq r$$

$$n+a > 0 \Rightarrow n > -a \quad n+a \neq 1 \Rightarrow n \neq -a+1$$

$$y = \sqrt{r-1} \cdot g_r^{n-r} \quad n-r > 0 \Rightarrow n > r$$

$$D = (r, 1]$$

$$r-1 \cdot g_r^{(n-r)} \geq 0 \Rightarrow 1 \cdot g_r^{n-r} \leq r$$

$$y = 1 \cdot g_r^{(r \cdot g_r^n - 1)} \quad n > 0, \quad r \cdot g_r^n \neq 1$$

$$D = (0, \infty) - \frac{1}{r}$$

$$1 \cdot g_r^n \neq 0 \quad n \neq \frac{1}{r}$$

$$y = \frac{r^n}{r^n+1} \neq 0 \quad r^n+1 \neq 0 \quad D = \mathbb{R}$$

$$y = \frac{r^n}{r^n-1} \neq 0 \quad r^n-1 \neq 0 \quad r^n \neq 1 \quad n \neq 0 \quad D = \mathbb{R} - \{0\}$$

$$y = \frac{r^n}{r^n-r} \neq 0 \quad r^n \neq r \quad n \neq \frac{1}{r} \quad D = \mathbb{R} - \{\frac{1}{r}\}$$

$$y = \frac{r^n}{r^n-r} \neq 0 \quad r^n \neq r \quad n \neq 1 \cdot g_r^r \quad D = \mathbb{R} - \{1 \cdot g_r^r\}$$

$$y = (rn+1)!$$

$$rn+1 \in \mathbb{N} \Rightarrow rn+1 \geq 0, rn+1 \in \mathbb{Z}$$

$$n = \frac{k-1}{r} \quad k \in [0, \infty] \quad D = \left\{ \frac{k-1}{r} \mid k \in \mathbb{N} \right\}$$

$$y = \left(\frac{rn-r}{rn-a} \right)! \quad rn-a \neq 0 \quad D = \left\{ \frac{rn-r}{rn-a} \mid n \in \mathbb{N}_0 \right\}$$

$$\frac{rn-r}{rn-a} \in \mathbb{N} \quad rn-a = n(rn-a) \Rightarrow rn-r = rn-a \Rightarrow a = r$$